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10/572,353

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Jean-Charles Guibert

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10/29/2009

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EXAMINER

JELSMA, JONATHAN G

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

10/29/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/572,353 | Applicant(s) GUIBERT, JEAN-CHARLES | |
| | Examiner Jonathan Jelsma | Art Unit 1795 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 11-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

1. This is the second office action based on application 10/572,353, and in response to Applicant Arguments/Remarks filed 08/18/2009.
2. Claims 1-10 are previously pending, of those claims, claims 1-7 have been amended, claims 8-10 have been canceled, and claims 11-12 are newly added claims. All amendments have been entered. Claims 1-7 and 11-12 are currently pending and have been fully considered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. The term "dimension" in claim 7 is a relative term which renders the claim indefinite. The term "dimension" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
6. Claim 7 recites the limitation "wherein the making includes making the patterns with a dimension between 50 nm and 10 microns." It is not clear if it is the pitch, the

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width of the patterns, the height of the patterns, the length of the patterns for example that the "dimension" is referring to.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1-2, 5-7, and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over KLOSNER (US 6,416,908 B1) in view of YUASA (US 2003/0104287 A1).

10. With respect to claims 1-2, 5-6, and 11. KLOSNER teaches a method of mask fabrication 9column 8 lines 48-52). KLOSNER teaches that electron beam mask writers are capable of patterning onto essentially planar substrates (column 8 lines 64-66). Therefore, KLOSNER teaches a method of fabricating curved mask (column 9 lines 1-3). The method includes using a planar mask, via contact printing to reproduce the

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pattern onto a resist coated metallized polymer membrane (column 9 lines 3-5) this thus formed patterned metallized polymer membrane is analogous to the plane mask of the present claims. The membrane is then stretched over a curved fused silica mask blank (column 9 lines 9-11) the fused silica mask blank is taken to be analogous to the glass of present claim 5. The thus formed polypropylene stretched over the fused silica blank serves as a curved mask having high dimensional stability (column 9 lines 14-16) and further as can be seen in figure 5 the pattern is facing away from the curved support. While KLOSNER teaches using polymer membrane such as polypropylene coated with aluminum (column 9 lines 6-8), KLOSNER also notes that other polymers or alternative materials may be suitable, so long as they can be fabricated in thin conformable sheets of uniform thickness, and are transparent to the wavelengths that are used in various imaging steps (column 9 lines 35-39).

11. KLOSNER does not explicitly teach that the plane mask has an SOI structure, comprising a layer of semiconductor material, a buried layer of insulant and a substrate.

12. YUASA teaches a method of making a mask for electron beam lithography (paragraph 0028). The mask that is formed comprises an SOI substrate having a silicon base layer, an insulating layer arranged on the silicon base layer, and an SOI layer arranged on the insulating layer (paragraph 0028). The SOI layer may then be patterned in a later step (paragraph 0038-0039).

13. At the time of the invention one having ordinary skill in the art would have been motivated to exchange the metallized polymer membrane of KLOSNER with the materials such as the silicon base layer, insulating layer, and SOI layer of YUASA,

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because KLOSNER teaches that alternative materials may be suitable, and YUASA teaches alternative electron beam mask materials that may be used in the method of KLOSNER, since this is the application of prior art materials for predictable results, of forming a electron beam lithography mask.

14. With respect to claim 7. Neither KLOSNER nor YUASA explicitly teaches that the mask has a pattern with a dimension between 50 nm and 10 microns. However, KLOSNER teaches that the mask needs to form features of about 1 micron (column 1 lines 58-59).

15. Therefore at the time of the invention one having ordinary skill in the art would have been motivated to make the mask features such a size to create the 1 micron features as a matter of routine experimentation, for example desired mask size and apparatus parameters.

16. With respect to claim 12. KLOSNER further teaches using the formed mask to transfer the pattern onto a resist coated blank by means of contact printing (column 9 lines 19-28, and figure 5).

17. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over KLOSNER (US 6,416,908 B1) in view of YUASA (US 2003/0104287 A1) and YUKI (US 2003/0054601 A1).

18. Claim 3 is dependent upon claims 1 or 2, which are rejected above in view of KLOSNER and YUASA. However, neither KLOSNER nor YUASA explicitly teaches thinning of the SOI structure.

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19. YUKI however teaches that a method of thinning the SOI substrate is part of a well known method of forming the SOI substrate, such as thinning the silicon wafer by polishing (paragraph 0053).

20. Therefore, at the time of the invention one having ordinary skill in the art would have been motivated to thin the SOI substrate as taught by YUKI as a matter of routine practice in the method of producing the SOI substrate, such as of KLOSNER as modified by YUASA.

21. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over KLOSNER (US 6,416,908 B1) in view of YUASA (US 2003/0104287 A1), YUKI (US 2003/0054601 A1), and FURUKAWA (US 2005/0202322 A1).

22. Claim 4 is dependent upon claims 1 or 2, which are rejected above in view of KLOSNER and YUASA. Neither KLOSNER nor YUASA teach the thinning of the planar mask and then installing a handle substrate before implementing the transferring.

23. YUKI however teaches that a method of thinning the SOI substrate is part of a well known method of forming the SOI substrate, such as thinning the silicon wafer by polishing (paragraph 0053).

24. Therefore, at the time of the invention one having ordinary skill in the art would have been motivated to thin the SOI substrate as taught by YUKI as a matter of routine practice in the method of producing the SOI substrate, such as of KLOSNER as modified by YUASA.

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25. None of KLOSNER, YUASA, nor YUKI explicitly teaches installing a handle substrate before implementing the transferring. However, FURUKAWA teaches the method of forming a mask that includes the method of using a handle substrate prior to transferring of the mask pattern to the mask blank (paragraph 0006).

26. At the time of the invention one having ordinary skill in the art would have been motivated to use the method of FURUKAWA of transferring the mask pattern from a handle substrate before the transferring of the pattern as taught by KLOSNER, YUASA, and YUKI, because by using the handle substrate, allows better and tighter thickness control of the patterns, as well as not having to worry about over etching the match pattern (paragraph 0006 of FURUKAWA).

Response to Arguments

27. Applicant's arguments, see 6 of Applicant Arguments/Remarks, filed 08/18/2009, with respect to objection of claims 4-7 have been fully considered and are persuasive. The objection of claims 4-7 has been withdrawn. The amendments to the claims have overcome the rejection, by making them so they are no longer multiple dependent claims dependent upon multiply dependent claims.

28. Applicant's arguments, see pages 7-8 of Applicant Arguments/Remarks, filed 08/18/2009, with respect to the rejection(s) of claim(s) 1-7 under 35 U.S.C. 103(a) in view of RUCHHOEFT and YUASA have been fully considered and are persuasive.

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Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of KLOSNER and YUASA.

29. On pages 7-8 of Applicant Arguments/Remarks, Applicant argues that RUCHOEFT forms a mask pattern on a curved substrate, and not a plane mask. This argument is persuasive.

30. However, new grounds of rejection have been made in view of KLOSNER and YUASA. Specifically as seen in figure 5 of KLOSNER patterns are formed on a planer mask, which is then attached to a mask blank. Then YUASA teaches the SOI structure.

Conclusion

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Jelsma whose telephone number is (571)270-5127. The examiner can normally be reached on Monday to Thursday 7:00 a.m. - 4:00 p.m.

32. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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33. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/

Supervisory Patent Examiner, Art Unit 1795

JGJ